CLAIMS

1. A method for forming a capacitor comprising: providing a non-oxide electrode; oxidizing an upper surface of said non-oxide electrode; depositing a high dielectric constant oxide dielectric material on the oxidized surface of said non-oxide electrode; and depositing an upper layer electrode on said high dielectric constant oxide dielectric material.

2. A method as claimed in claim 1 wherein the oxidation of said upper surface of said non-oxide electrode is carried out in an atmosphere containing an oxidizing gas selected from the group consisting of $O_2$, $O_3$, $H_2O$, and $N_2O$.

3. A method as claimed in claim 1 wherein the oxidation of said upper surface of said non-oxide electrode is carried out at a temperature in the range of from about 250° to about 700°C.

4. A method as claimed in claim 1 wherein said non-oxide electrode is selected from the group consisting of TiN, TaN, WN, and W.

5. A method as claimed in claim 1 wherein said high dielectric constant oxide dielectric material is selected from the group consisting of $Al_2O_3$, $Ta_2O_5$ and $Ba_xSr_{(1-x)}TiO_3$.

6. A method as claimed in claim 1 wherein the oxidation of said upper surface of said non-oxide electrode is performed in an oxide dielectric deposition chamber under oxidizing conditions prior to the deposition of said high dielectric constant oxide dielectric material.

7. A method as claimed in claim 1 wherein the oxidation of said upper surface of said non-oxide electrode comprises oxidizing using an $O_3$ gas plasma.

8. A method as claimed in claim 7 wherein the oxidation is carried out at a temperature in the range of from about 250° to about 500°C.

9. A method for forming a capacitor comprising: providing a non-oxide electrode selected from the group consisting of TiN, TaN, WN, and W, oxidizing an upper surface of said non-oxide electrode, depositing a high dielectric constant oxide dielectric material on the oxidized surface of said non-oxide electrode, and depositing an upper layer electrode on said high dielectric constant oxide dielectric material.

10. A method as claimed in claim 9 wherein said high dielectric constant oxide dielectric material is selected from the group consisting of $Al_2O_3$, $Ta_2O_5$ and $Ba_xSr_{(1-x)}TiO_3$.

11. A method as claimed in claim 9 wherein the oxidation of said upper surface of said non-oxide electrode is carried out in an atmosphere containing an oxidizing gas selected from the group consisting of $O_2$, $O_3$, $H_2O$, and $N_2O$.

12. A method as claimed in claim 9 wherein the oxidation of said upper surface of said non-oxide electrode is carried out at a temperature in the range of from about 250° to about 700°C.

13. A method as claimed in claim 9 wherein the oxidation of said upper surface of said non-oxide electrode is performed in an oxide dielectric deposition chamber under oxidizing conditions prior to the deposition of said high dielectric constant oxide dielectric material.

14. A method as claimed in claim 9 wherein the oxidation of said upper surface of said non-oxide electrode comprises oxidizing using an $O_3$ gas plasma.

15. A method as claimed in claim 14 wherein the oxidation is carried out at a temperature in the range of from about 250° to about 500°C.

16. A method for forming a capacitor comprising: providing a non-oxide electrode selected from the group consisting of TiN, TaN, WN, and W, oxidizing an upper surface of said non-oxide electrode, depositing a high dielectric constant oxide dielectric material selected from the group consisting of $Al_2O_3$, $Ta_2O_5$ and $Ba_xSr_{(1-x)}TiO_3$ on the oxidized surface of said non-oxide electrode, and depositing an upper layer electrode on said high dielectric constant oxide dielectric material.

17. A method as claimed in claim 16 wherein the oxidation of said upper surface of said non-oxide electrode is carried out in an atmosphere containing an oxidizing gas selected from the group consisting of $O_2$, $O_3$, $H_2O$, and $N_2O$.

18. A method as claimed in claim 16 wherein the oxidation of said upper surface of said non-oxide electrode is carried out at a temperature in the range of from about 250° to about 700°C.

19. A method as claimed in claim 16 wherein the oxidation of said upper surface of said non-oxide electrode is performed in an oxide dielectric deposition chamber under oxidizing conditions prior to the deposition of said high dielectric constant oxide dielectric material.

20. A method as claimed in claim 16 wherein the oxidation of said upper surface of said non-oxide electrode comprises oxidizing using an $O_3$ gas plasma.

21. A method as claimed in claim 20 wherein the oxidation is carried out at a temperature in the range of from about 250° to about 500°C.

22. A method for forming a capacitor comprising: providing a non-oxide electrode, in a deposition chamber oxidizing an upper surface of said non-oxide electrode, in the same deposition chamber depositing a high dielectric constant dielectric material on the oxidized surface of said non-oxide electrode, and depositing an upper layer electrode on said high dielectric constant oxide dielectric material.

23. A method for forming a capacitor comprising: providing a non-oxide electrode, oxidizing an upper surface of said non-oxide electrode at a temperature in the range of from about 250° to about 700°C in an atmosphere containing a gas selected from the group consisting of $O_2$, $O_3$, $H_2O$, and $N_2O$, depositing a high dielectric constant dielectric material on the oxidized surface of said non-oxide electrode, and depositing an upper layer electrode on said high dielectric constant oxide dielectric material.

24. A method as claimed in claim 23 wherein said non-oxide electrode is selected from the group consisting of TiN, TaN, WN, and W.

25. A method for forming a capacitor comprising: providing a non-oxide electrode, oxidizing an upper surface of said non-oxide electrode in an atmosphere containing a gas plasma generated from a gas selected from the group consisting of $O_2$, $O_3$, $H_2O$, and $N_2O$, depositing a high dielectric constant dielectric material on the oxidized surface of said non-oxide electrode, and depositing an upper layer electrode on said high dielectric constant oxide dielectric material.

26. A method as claimed in claim 25 wherein the oxidation of said upper surface of said non-oxide electrode is carried out at a temperature in the range of from about 250° to about 500°C.

27. The method of claim 25 wherein said non-oxide electrode is selected from TiN, TaN, WN, and W.

28. A method as claimed in claim 25 wherein said high dielectric constant oxide dielectric material is selected from the group consisting of $Al_2O_3$, $Ta_2O_5$ and $Ba_xSr_{(1-x)}TiO_3$.

29. A method for forming a capacitor comprising: providing a non-oxide electrode selected from the group consisting of TiN, TaN, WN, and W, oxidizing an upper surface of said non-oxide electrode in an atmosphere containing a gas plasma generated from a gas selected from the group consisting of $O_2$, $O_3$, $H_2O$, and $N_2O$, depositing a high dielectric constant oxide dielectric material selected from the group consisting of $Al_2O_3$, $Ta_2O_5$ and $Ba_xSr_{(1-x)}TiO_3$ on the oxidized surface of said non-oxide electrode, and depositing an upper layer electrode on said high dielectric constant oxide dielectric material.

30. A capacitor comprising a non-oxide electrode having an oxidized upper surface, a high dielectric constant oxide dielectric material adjacent said oxidized upper surface of said non-oxide electrode, and an upper layer electrode adjacent said high dielectric constant oxide dielectric material.

31. A capacitor as claimed in claim 30 wherein said non-oxide electrode is selected from the group consisting of TiN, TaN, WN, and W.

32. A capacitor as claimed in claim 30 wherein said high dielectric constant oxide dielectric material is selected from the group consisting of $Al_2O_3$, $Ta_2O_5$ and $Ba_xSr_{(1-x)}TiO_3$.

33. A capacitor comprising a non-oxide electrode selected from the group consisting of TiN, TaN, WN, and W, an upper surface of said non-oxide electrode being oxidized, a high dielectric constant oxide dielectric material adjacent said upper surface of said non-oxide electrode, and an upper layer electrode adjacent said high dielectric constant oxide dielectric material.

34. A capacitor as claimed in claim 33 wherein said high dielectric constant oxide dielectric material is selected from the group consisting of $Al_2O_3$, $Ta_2O_5$ and $Ba_xSr_{(1-x)}TiO_3$.

35. A capacitor comprising a non-oxide electrode having an oxidized upper surface, a high dielectric constant oxide dielectric material is selected from the group consisting of $Al_2O_3$, $Ta_2O_5$ and $Ba_xSr_{(1-x)}TiO_3$ adjacent said upper surface of said non-oxide electrode, and an upper layer electrode adjacent said high dielectric constant oxide dielectric material.

36. A capacitor as claimed in claim 35 wherein said non-oxide electrode is selected from the group consisting of TiN, TaN, WN, and W.

37. A capacitor comprising a non-oxide electrode selected from the group consisting of TiN, TaN, WN, and W, an upper surface of said non-oxide electrode having been oxidized with an $O_3$ gas plasma, a high dielectric constant oxide dielectric material selected from the group consisting of $Al_2O_3$, $Ta_2O_5$ and $Ba_xSr_{(1-x)}TiO_3$ adjacent to said oxidized upper surface of said non-oxide electrode, and an upper layer electrode adjacent said high dielectric constant oxide dielectric material.

38. A method of forming a DRAM cell comprising providing a non-oxide electrode, oxidizing an upper surface of said non-oxide electrode, depositing a layer of a high dielectric constant oxide dielectric material on the oxidized surface of said non-oxide electrode, depositing an upper layer electrode on said layer of said high dielectric constant oxide dielectric material, providing a field effect transistor having a pair of source/drain regions, electrically connecting one of said source/drain regions with said conductive oxide electrode and electrically connecting the other of said source/drain regions with a bit line.